

D E F E N S E
A N D A R M S
C O N T R O L
S T U D I E S
P R O G R A M

Annual Report • 1989–1990

MASSACHUSETTS
INSTITUTE
OF TECHNOLOGY



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D E F E N S E A N D A R M S C O N T R O L

S T U D I E S P R O G R A M

The Defense and Arms Control Studies (DACS) Program is a graduate level, research and training program based at the MIT Center for International Studies. It traces its origins to two initiatives. One is the teaching on security topics that Professor William Kaufmann began in the 1960's in the MIT Political Science Department. The other is the institution wide seminars on nuclear weapons and arms control policy that Professor Jack Ruina and Professor George Rathjens created in the mid 1970's.

Currently the program's teaching ties are primarily but not exclusively with the Political Science Department at MIT. The DACS faculty includes natural scientists and engineers as well as social scientists. Of particular pride to the program is its ability to integrate technical and political analyses in studies of international security issues.

Several of the DACS faculty members have had extensive government experience. They and the other program faculty advise or comment frequently on current policy problems. But the program's prime task is educating those young men and women who will be the next generation of scholars and practitioners in international security policy making. The program's research and public service activities necessarily complement that effort.

The Center for International Studies is a major interdependent research facility at MIT and seeks to encourage the analysis of issues of continuing public concern. Key components of the Center in addition to DACS are Seminar XXI, which offers training in the analysis of international issues for senior military officers, government officials, and industry executives; and the MIT Japan Program, which conducts research and educational activities to further knowledge about Japanese technology, economic activities, and politics.

COVER PHOTO

*STATUE OF GEORGE WASHINGTON
PUBLIC GARDEN, BOSTON, MASSACHUSETTS
PHOTOGRAPH BY ERIC S. ROSENTHAL*

REPORT OF THE DIRECTOR

A year ago it was possible, with only slight exaggeration, to fear a Soviet breakthrough along the inter-German border. Tens of thousands of Soviet tanks could be envisioned racing West to the Channel and in the process capturing the heart of European industrial capacity. But since then Communism has rotted away nearly everywhere in Europe, the Warsaw Pact has been acknowledged to be inoperable as a military alliance, the Berlin Wall is being broken up for souvenirs, and Soviet Forces stationed in East Germany have been placed on a West German dole. These days the only tanks likely to be moving West are our own when they begin to assemble for shipment home along with their divisional colors. The Cold War seems not only over, but won as well.

The past year was also my first as director of the Program. Some might think that this is a less than favorable time to become involved again in security studies, but I do not. Reduced tensions between the superpowers is a much sought, much welcomed situation. The purpose of programs like the one at MIT is to help make the world more peaceful through its scholarship, graduate training, and public service. When peace between the U.S. and the Soviet Union appears to be breaking out, there can be no regrets even if there may be some administrative inconvenience.

The demise of the Cold War is, in fact, extraordinarily liberating for security studies. No longer are the field's members tied to a catechism of predictable problems and absolving beliefs. Corridor conversations, seminar presentations, and classroom debates have been absorbed with seeking an understanding of last year's developments; nearly all the field's most fundamental questions are open again for examination. It is a challenging and exciting time.

I believe a central conclusion of these discussions is that the end of the Cold War does not assure American or global peace and security. The potential for armed conflict surely has been greatly reduced, but it has not been eliminated. What has been eliminated to a considerable extent is the bipolarization of tensions, the tendency to define all conflicts as East/West confrontations. As relations between the superpowers improve, the constraints on many of these conflicts will be lifted. Old disputes suppressed by the needs of the superpowers to hold allies in check can easily rekindle when the requirement for coalition discipline fades. And new ones may arise because of regional dissatisfaction with the terms of disengagement between the superpowers.

The collapse of Communism not only frees the democratic spirit, but also reawakens nationalistic passion and religious zeal. The Soviet Union may crumble as a viable

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political unit, leaving unsettled what element among its several surviving parts owns which of its many weapons and resources. Revolutions are seldom orderly or blood free and it has been a revolution that we have been observing. There are many, many scores to settle.

Paradoxically, reductions in the standing forces of the most heavily armed nations in the world may increase the availability of advanced weapons elsewhere in the world. Some weapons will be sold or given away as surplus. Others will be offered on attractive terms by weapon suppliers urgently seeking replacement markets. Certainly, one must expect the rapid diffusion of submarine, missile, and aircraft technologies when the reason for guarding the knowledge declines in apparent importance. If lethality is the measure, there soon should be fewer and fewer low intensity conflicts even among or with developing nations.

The demands on DACS faculty have increased because of changing events. Stephen Meyer was especially busy this year due to his expertise in the Soviet military and its role in Soviet policy making processes. He not only was a major source for the news networks and magazines, but was also called upon frequently to brief the President and senior government officials and to testify before Congress. His working group on Soviet security studies has focused on Soviet industry's capabilities and plans for conversion from military to civilian production, quickly becoming a national clearinghouse on the subject.

New to DACS this year was Theodore Postol who joined the MIT faculty from Stanford where he had helped organize a program to train mid-career scientists in defense and arms control policy. As Professor of Science, Technology and National

Security Policy, he has taken a lead in our work on defense technology. Among his many activities was a seminar series on Science, Technology, and National Security jointly sponsored with the Harvard Center for Science and International Affairs. This series brought leading specialists to Cambridge to discuss current trends and issues affecting a wide range of weapons-related technologies. I am happy to report also that Professor Postol received the prestigious Leo Szilard Award this year from the American Physical Society in recognition of his important contributions to the analysis of public policy problems.

One issue that the Program paid special attention to was how America's cutting edge research and development activities, so much tied to defense, will adjust to the inevitable reductions in defense expenditures. Jack Ruina has been very active in organizing our work on the problem. He convened a series of faculty dinners where national figures explored the science policy implications of a reduced defense budget. And he sought collaboration and sponsorship for a workshop to identify the policy options. With MIT's obvious need to play a leading role in providing science policy guidance, it is likely that we will be ever more involved in R & D issues of this type.

The program's expertise extends beyond substantive problems of defense. Over the years, George Rathjens has taught systems analytical techniques to our students and in the process utilized environmental and health problems as well as defense problems in the application examples. This year he has been examining in various MIT-wide settings the methodological issues involved in the global warming problem, and has been planning, along with Jack Ruina, to create a workshop for college teachers on

the global warming problem, which would be modelled after the very successful workshops they organized in previous years on nuclear weapons.

Barry Posen has taken a lead in helping the MIT Political Science Department expand its staffing in international relations. As the world restructures, student interest in international relations grows. Thanks to Barry's efforts, and those of Hayward Alker and Nazli Choucri, the department has been able to attract two outstanding specialists, Kenneth Oye of Swarthmore and Stephen Van Evera of Harvard, both of whom will be at MIT this coming year. They, no doubt, will be actively involved in the MIT Center for International Studies, DACS home, adding to this already vibrant intellectual community.

My own efforts have been devoted to expanding the research content of the Program. In particular, I encouraged the formation of working groups, extra-curricular collaborations of faculty and graduate students, that are focused on specific research topics. The model for this activity is the effective Soviet Security Studies Working Group that Stephen Meyer established nearly a decade ago. Five new working groups were convened with each choosing its own format. One, the Security of the North Pacific, was created jointly with the MIT Japan Program. The others are led by DACS faculty. All DACS students in residence participate in one or more of the groups.

To give a flavor of their promise, I need only highlight Barry Posen's Conventional Forces Working Group which has as its central focus the analysis of breakthrough battles. The fear after the end of the Cold War, just as it was during that war, will be of a breakthrough where an aggressor concentrates forces quickly and cracks a defensive

line in a decisive battle. The working group has been examining classic battles from the Second World War and beyond to determine what were the circumstances that lead to success or failure in breakthrough attempts. The post-Cold War Europe will likely have thinner forces, therefore increasing the risk of breakthroughs. But if the lessons of past experience are understood, it may be possible to devise defense lines and mobile reserves that can either stymie breakthroughs or deter their attempt. In my view this is an extremely valuable effort in theory building and historical analysis that could have important policy payoffs.

In late April we held a program-wide research symposium at which the various research groups reported on their work and plans. The presentations, often done by graduate students, captured well the excitement of the research and gave promise for the production of a series of first rate books and articles. This symposium surely will be an annual event with a broad attendance.

I also increased the program's own list of publications. There is now a monthly newsletter, *DACS Facts*, that is circulated to program participants and alumni and that serves as a calendar of future events and the paper of record for program achievements. It is edited with just the right light touch by Judith Spitzer. Soon, we will produce the first issue of a semi-annual program review that will provide the program's friends elsewhere with our views on security policy developments and options as well as information on program activities.

In addition, on Stephen Meyer's initiative, the Soviet Security Studies Working Group began publishing a monthly research report, *Soviet Defense Notes*, that has a rapidly expanding circulation. It provides reviews of Soviet military developments

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based on analyses of original source materials and is distributed to research libraries in academia, industry, and government. I am pleased with both its effectiveness as a mechanism for training graduate students and its wide acceptance among specialists.

The number of students affiliated with the program has grown. Over 40 are currently involved in the program in residence or elsewhere, either completing theses or preparing to do so. All but two are enrolled in the political science department and most, 35 to be precise, are doctoral candidates. This makes DACS the largest program of its type in the United States and likely the world.

Graduates of the program continue to achieve great success. Many now hold senior positions in government, the military, industry, foundations, and public interest groups and several have begun the climb in universities. Now it is not possible to prepare a serious reading list for security studies subjects without including many of their publications.

This year, as in the past, we have had outstanding visitors. It is disappointing to me, however, that funds are less and less available for the science Ph.D. who wishes to come to the program to gain an understanding of policy issues that link defense and technology. The mark of the program has been its ability to tie together technology and policy. In the past we have had sufficient financial support for several recent graduates to do their post-doctoral training with us. With the passing of Cold War concerns about nuclear weapons, it undoubtedly will be harder to get the assistance needed to provide this training opportunity.

I am also disappointed to note that the Air Force is not renewing the assignment of an officer to the program through the Center for International Studies. These officers, who held the title of research associ-

ate, often were invaluable as informal instructors, offering our students the insights of their long experience in national security affairs. In return the officers had the opportunity to attend lectures and do research on topics relevant to future assignments.

Of course, this may be the reason why there is more than one armed service in the American military. Relations with the Army are excellent, enhanced by the officers who enroll at MIT for a master's degree on the way to an assignment as an instructor in the Social Sciences Department at West Point. Their participation in the program often continues long after they leave MIT. Ties with the Navy are growing in part due to my own research interests. It was coincidental, however, that our field trip this year was to the Submarine School and Naval Base at New London, Connecticut.

Financial support for the program comes from several sources. MIT provides substantial assistance, including most of the support for the faculty and some student support as well. External assistance comes from the Carnegie Corporation of New York, the William and Flora Hewlett Foundation, the Ford Foundation, the Pew Charitable Trusts, the John D. and Catherine T. MacArthur Foundation, and the Alfred P. Sloan Foundation. In addition, we continue to receive grants from the Department of Defense to support Soviet security studies. The continued interest in the program and vital assistance of these organizations are greatly appreciated.

This year I initiated a corporate consortium to build ties between DACS and defense laboratories and firms. These organizations have expertise in many topics that are of interest to the program and a perspective on defense policy matters that the faculty and students need to understand. To date, Lincoln Laboratory, the Mitre Corporation, and the

McDonnell Douglas Astronautics Co. have joined the consortium and provided limited financial contributions to our activities. There is no expectation that these contributions will account for more than ten percent of the financial requirements of the program or that contract work will be involved. They are, however, much valued.

Finally, I would like to indicate topics in which I think DACS may want to place emphasis in the future. One necessarily will be the intersection between national security and environmental issues. I have already mentioned the global warming problem which some say may lead to serious international conflict and perhaps even the use of force. But the issues that I have in mind are more immediate in impact and more directly military related. Included among them are conflicts between environmentalists and arms controllers over the disposal of weapons, the cleanup hazards on military sites, the environmental obstacles to renewing nuclear weapons production, and the environmental stewardship aspects of weapon design and acquisition.

A second area is the economic challenges of reducing defense expenditures. Here we need to be

concerned about identifying research and production activities that should be retained as a security hedge and those whose elimination may have competitive consequences. Distinguishing between security and trade problems may become difficult as Japan and Germany acquire increased weapon design and production capabilities and more interest in having a political role to match their enhanced economic standing. Various collaborative efforts within and outside of MIT are possible in the exploration of this topic.

Third, I believe we need to understand the effects of budget reductions on the capabilities of the armed forces and on their strategic choices. Reductions will shift power within the military and between the military and civil authorities. The potential for significant tension exists. More likely there will be neglect. If the past is any judge, as attention drifts away in thoughts of a permanent peace, the seeds of change in military doctrine and weapons are being planted that will have significant impact on the conduct of our next war.

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Harvey M. Sapolsky

FACULTY

HARVEY M. SAPOLSKY is Professor of Public Policy and Organization in the Department of Political Science and Director of the Defense and Arms Control Studies Program. Dr. Sapolksy completed his B.A. at Boston University and earned his M.P.A. and Ph.D. at Harvard University. He has worked in a number of public policy areas, notably health and defense where his work examines the effects of institutional structure and bureaucratic politics on policy outcomes. In defense he has served as a consultant to the Commission on Government Procurement, the Naval War College, the Office of Naval Research, and the RAND Corporation, and has lectured at all of the service academies. In July 1989 he succeeded Professor Ruina as Director of the MIT Defense and Arms Control Studies Program. Professor Sapolksy's most recent book is titled, *Science and the Navy*.



STEPHEN M. MEYER is Professor of Defense and Arms Control Studies and Director of Soviet Security Studies at MIT. Prior to joining the MIT faculty, he was a post-doctoral fellow at Harvard University's Center for Science and International Affairs. He received his Ph.D. at the University of Michigan, Ann Arbor. Dr. Meyer's areas of particular interest are Soviet defense decision-making, military economics, force planning and analysis, and arms control. He is currently completing a book that examines the evolution of Soviet military power in the 1970s and 1980s, and the ways in which organizations and institutions

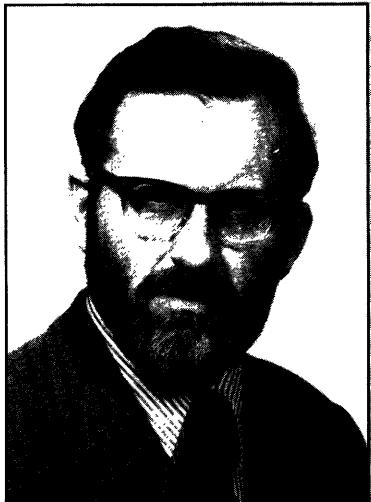
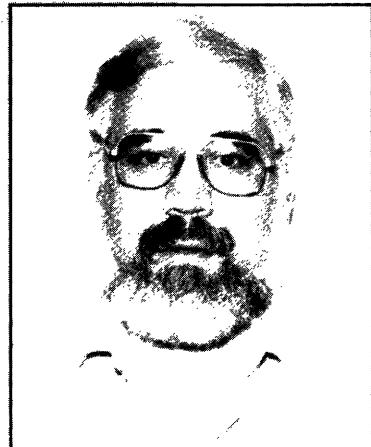
Influenced Soviet defense policy. Dr. Meyer serves as an advisor on Soviet security affairs to the Department of Defense, the State Department, the Office of Technology Assessment, and other government agencies. At White House request he has briefed President Bush and the Secretaries of Defense and State on a number of occasions. Dr. Meyer has testified numerous times in open and closed hearings before the House Armed Services Committee, the Senate Armed Services Committee, and the Senate Select Committee on Intelligence. He also consults for the RAND Corporation, the MITRE Corporation, and System Planning Corporation.

BARRY R. POSEN is Associate Professor of Political Science. Dr. Posen did his undergraduate work at Occidental College and his graduate work at the University of California at Berkeley, where he earned an M.A. and Ph.D. Prior to coming to MIT, Dr. Posen was Assistant Professor of Politics and International Affairs at Princeton University. He has also held a number of prestigious positions: Guest Scholar at the Brookings Institution; Post-Doctoral Fellow at the Center for International Affairs at Harvard; Council on Foreign Relations International Affairs Fellow; Rockefeller Foundation International Affairs Fellow; Guest Scholar at the Georgetown Center for Strategic and International Studies; and Woodrow Wilson Center Fellow, Smithsonian Institution. His book, *The Sources of Military Doctrine*, won the American Political Science Association's Woodrow Wilson Foundation Book Award for the best book published in political science in 1984, and Ohio State University's Edward J. Furniss Jr. Book Award for the best first book in the field of security studies. Dr. Posen's current activities include work on the control of escalation, U.S. military strategy and force structure, and nationalism. His forthcoming book, *Inadvertent Escalation*, will be published by Cornell University Press in 1991.



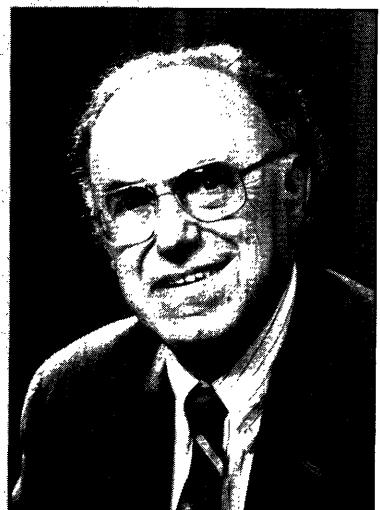
FACULTY

THEODORE A. POSTOL is Professor of Science, Technology and National Security Policy in the Program in Science, Technology, and Society at MIT. He did his undergraduate work in Physics and his graduate work in Nuclear Engineering at the Massachusetts Institute of Technology. After receiving his Ph.D., Dr. Postol joined the staff of Argonne National Laboratory, where he used neutron, x-ray and light scattering, along with computer molecular dynamics techniques, to study the microscopic dynamics and structure of liquids and disordered solids. Subsequently he went to the Congressional Office of Technology Assessment to study methods of basing the MX Missile, and later worked as a scientific adviser to the Chief of Naval Operations. After leaving the Pentagon, Dr. Postol helped to build a program at Stanford University to train mid-career scientists to study developments in weapons technology of relevance to defense and arms control policy. In 1990 Dr. Postol received the Leo Szilard Award from the American Physical Society.



GEORGE W. RATHJENS became Professor in the Department of Political Science after service with the Institute for Defense Analyses, the U.S. Arms Control and Disarmament Agency, the Advanced Research Projects Agency of the Department of Defense, the Office of the President's Science Advisor, and the Weapons Evaluation Group of the Department of Defense. Dr. Rathjens received his B.S. from Yale University and completed his Ph.D. in chemistry at the University of California at Berkeley. He is active in a number of associations, including the Council for a Livable World of which he is Chairman and the Federation of American Scientists of which he is Sponsor, Councillor, and Past Chairman. Dr. Rathjens' major policy focus is on nuclear arms control and Soviet-American relations.

JACK RUINA is Professor of Electrical Engineering. Dr. Ruina was an undergraduate at the City College of New York and did his graduate work at the Polytechnic Institute of Brooklyn, earning his M.E.E. and D.E.E. there. He taught at Brown University and the University of Illinois; at the latter he also headed the Radar Division of the Control System Laboratory. While on leave from the University of Illinois, he served in several senior positions at the Department of Defense, the last being Director of the Advanced Research Projects Agency. He also held the post of President of the Institute for Defense Analyses. At MIT, he has held the position of Vice President for Special Laboratories and is currently Secretary of the MIT Faculty. He was instrumental in establishing the Defense and Arms Control Program and was its first Director. Dr. Ruina's special interest is in strategic relations between the U.S. and the Soviet Union.



In addition to the core faculty on the preceding pages who take prime responsibility for advising program affiliated students, there are a number of other faculty members who help supervise student research and who participate in the intellectual life of the program. At MIT these were Carl Kaysen, David W. Skinner Professor of Political Economy in the Program in Science, Technology and Society; Marvin Miller, Senior Research Scientist in the Department of Nuclear Engineering; Lucian Pye, Professor of Political Science; Richard Samuels, Professor of Political Science and Director of the MIT Japan program; Suzanne Berger, Ford International Professor of Political Science and Chair, MIT Political Science Department; and William Griffith, Ford Professor of Political Science, who is retiring at the end of the academic year. Among those assisting who have appointments outside of MIT were Richard Eichenberg, Associate Professor of Political Science, Tufts University, and Gregory Treverton, Senior Fellow and Director of the Europe-America Project at the Council on Foreign Relations.

V I S I T O R S

Crispin Hain-Cole

Ministry of Defence, The United
Kingdom, London, England
Visiting Scholar
January–May 1990

George Lewis

Department of Physics, Cornell
University, Ithaca, New York
Post-Doctoral Fellow
September 1989–June 1990

Kenneth Freeman

Department of War Studies,
Kings College London University,
London, England
Post-Doctoral Fellow
September 1989–January 1990
Visiting Scholar
January 1990–June 1990

Ingeborg Mehser

Department of Political Science,
Free University of Berlin, Berlin,
Federal Republic of Germany
Volkswagen Pre-Doctoral Fellow
October 1989–June 1990

Thorsten Goerresen

Department of Political Science,
Free University of Berlin, Berlin,
Federal Republic of Germany
Volkswagen Pre-Doctoral Fellow
February 1990–June 1990

James G. Sierchio

Major, United States Air Force
U.S. Air Force Research Associate
September 1989–June 1990

Lisbeth Gronlund

Department of Physics, Cornell
University, Ithaca, New York
Post-Doctoral Fellow
September 1988–June 1990

D A C S - A F F I L I A T E D D E G R E E R E C I P I E N T S

1 9 8 9 / 1 9 9 0

Ivo Daalder
Ph.D., February 1990

“The Nature and Practice of Flexible Response:
Theater Nuclear Forces and NATO Strategy”

Brian McCue
Ph.D., February 1990

“U-Boats in the Bay of Biscay: Countermeasures
and Measures of Effectiveness”

Jonathan Tucker
Ph.D., February 1990

“Shifting Advantage: A Game-Theoretical Model of
International Collaboration in Advanced Technology”

Laura Holgate
S.M., June 1990

“The Environmental Politics of Chemical Weapons
Destruction”

Jeffrey Sands
S.M., June 1990

“The Soviet Military and Coalition Warfare: Soviet
Military Views on the Past and Future of NATO
and Warsaw Pact Cohesion and Effectiveness”

G R A D U A T E S T U D E N T S • 1 9 8 9 / 1 9 9 0

**PH.D. CANDIDATES
POST-GENERALS**

**ACADEMIC
HISTORY**

**CURRENT
THESIS TOPIC**

Larry Brown

B.A., Howard Payne University,
Political Science/Economics
M.B.A., University of New
Mexico, *Management*
M.A., University of New Mexico,
Political Science

Arms Control Policy

Jeffrey Checkel

B.S., Cornell University, *Physics*

Soviet Foreign-Policy Decisionmaking

Dean Cheng

B.A., Princeton University,
Politics

Japanese Defense Policy

Graduate Students continued on next page . . .

PH.D. CANDIDATES POST-GENERALES	ACADEMIC HISTORY	CURRENT THESIS TOPIC
Owen Coté	B.A., Harvard University, <i>Social Studies</i>	An Analysis of the Sources of American Nuclear Doctrine
Neta Crawford	B.A., Brown University, <i>Independent Studies</i>	Force Prone States: Sources of Highly Militarized International Behavior
Steven Flank	A.B., Cornell University, <i>Physics</i>	Technology, Arms Control, and the Arms Race: Limits on the Flight Testing of Ballistic Missiles
Sybil Francis	B.A., Oberlin College, <i>Chemistry</i>	History and Analysis of the Politics of the National Weapons Labs
Shannon Kile	B.A., Rice University, <i>History</i>	The Changing Security Calculus on NATO's Northern Flank
Peter Liberman	B.A., Reed College, <i>Philosophy</i>	Exploitation of Industrial Economies by Foreign Powers
Katherine Magraw	B.A., Yale University, <i>History</i>	Congress' Reactions to Reagan's Defense Policies
Gregg Martin	B.S., United States Military Academy, <i>Civil Engineering</i>	Combat Engineers: An Institutional Analysis
Kevin Oliveau	B.S., Massachusetts Institute of Technology, <i>Computer Science</i>	Principles of Space Warfare
Matthew Partan	A.B., Harvard University, <i>Physics</i>	Policymaking Process and Soviet Military Doctrine
Richard Phillips	B.A., University of Mississippi, <i>Political Science</i>	Technological Innovation and Operational Tactical Adaptation in the Soviet Military
Laura Reed	A.B., Harvard University, <i>Sociology/Anthropology</i>	Alternatives to the Cold War: Paths Not Taken
Jeffrey Sands	B.A., Amherst College, <i>American Studies</i>	Soviet Decision Making and Assessments of the West
Robert Snyder	B.A., United States Military Academy, <i>Social Science</i>	Congress and Defense
Judyth Twigg	B.S., Carnegie Mellon University, <i>Physics</i> M.A., University of Pittsburgh, <i>Political Science</i>	Comparative Military Economics and Weapons Acquisition Issues
Robert Zirkle	B.S., University of Illinois, <i>Physics</i> B.A., University of Illinois, <i>Political Science</i>	Structural Innovation in the Military: The Case of the Army's Light Infantry Divisions

PH.D. CANDIDATES PRE-GENERALS	ACADEMIC HISTORY	PH.D. CANDIDATES PRE-GENERALS	ACADEMIC HISTORY
J. Nicholas Beldecos	A.B., Princeton University, <i>Politics</i>	Eric Labs	B.A., Tufts University, <i>Political Science/Classics</i>
John Brown	B.S., United States Military Academy, <i>Physics</i>	Daniel Lindley	B.A., Tufts University, <i>International Relations/French</i>
James Chung	B.A., Stanford University, <i>Political Science</i> M.A., Stanford University, <i>International Policy Studies</i>	Brian Nichiporuk	B.A., University of Chicago, <i>Political Science</i>
Eric Heginbotham	B.A., Swarthmore College, <i>Political Science</i>	Christopher Savos	B.A., Dartmouth College, <i>Political Science</i>
Christopher Herrick	B.A., Cornell University, <i>Government/Computer Science</i>	Michael Shirer	B.A., University of Iowa, <i>History</i> M.P.M., University of Maryland, <i>National Security</i>
Wade Jacoby	Certificate, University of Bonn, <i>European Studies</i> B.S., Brigham Young, <i>European Studies</i>	Brian Taylor	B.A., University of Iowa, <i>Political Science</i> M.Sc., London School of Economics, <i>Soviet Politics</i>
Jane Kellett	B.A., Oberlin College, <i>English</i>	Timothy Temerson	B.A., Grinnell College, <i>Political Science</i>
Heinz Kern	B.A., Goethe Institute, <i>Economics</i> M.A., Goethe Institute, <i>Economics</i> B.C.D., Johns Hopkins University, <i>International Relations and Security Studies</i> M.A.I.A., Johns Hopkins University, <i>International Relations and Security Studies</i>	Trevor Thrall	B.A., University of Michigan, <i>Political Science</i>
		Jeanette Voas	B.A., University of Virginia, <i>Russian Studies</i> M.A., University of Michigan, <i>Soviet Studies</i>
MASTERS CANDIDATES	ACADEMIC HISTORY	MASTERS CANDIDATES	ACADEMIC HISTORY
Robert Forrester	B.A., United States Military Academy, <i>Political Science</i>	Robert Newman	B.S., Massachusetts Institute of Technology, <i>Physics</i>
Laura Holgate	B.A., Princeton University, <i>Politics</i>	Kevin O'Prey	B.A., Grinnell College, <i>International Relations</i>
Dana Isaacoff	B.A., Cornell University, <i>Labor Relations</i> M.A., New School for Social Research, <i>Media</i>	Jerrard Sheehan	B.S., Massachusetts Institute of Technology, <i>Electrical Engineering</i>
Paul Nagy	B.A., Boston University, <i>International Relations</i>		

The working groups bring together on a regular basis, faculty and students interested in examining a focused topic through individual and collaborative projects. Group sessions include research reviews, thesis presentations, guest speakers and research design efforts. All groups report on their progress in the spring at a DACS symposium.

CONVENTIONAL FORCES

The Conventional Forces Working Group explores military doctrines and strategies for non-nuclear forces that may be employed in a variety of settings. The group's recent work on armored breakthrough battles has been used to develop an understanding of the determinant of success in conventional warfare, and implications for encouraging stability.

Barry Posen, Working Group Leader

DEFENSE POLITICS

The Defense Politics Working Group is concerned with the internal politics of the U.S. military and with civil-military relations in an era of reduced defense expenditures. The working group's recent work has focused on the policy implications of inter- and intra-service rivalry.

Harvey M. Sapolsky, Working Group Leader

NEW DIRECTIONS IN INTERNATIONAL SECURITY AND DEFENSE POLICY

The "New Directions" Working Group was organized to respond to the rapidly changing world events that represent the end of the Cold War. The group's early research has looked at the nature of threats facing the U.S. today, the role of international law in shaping norms and expectations of states, and the role of international peacekeeping.

George Rathjens and Jack Ruina, Working Group Leaders

SECURITY OF THE NORTH PACIFIC (NORPAC)

The work of the "NORPAC" Working Group focuses on economic and political issues as well as security developments in the Pacific region, especially Japan, Korea and China. The group has reviewed various weapons acquisitions, the effects of changing U.S.-Soviet relations on the security of the North Pacific, and the possibility of a rapprochement between the Soviet Union and Japan. NORPAC is convened jointly with the MIT Japan Program at the Center for International Studies.

Stephen Meyer, Richard Samuels, and Harvey Sapolsky, Working Group Leaders

SOVIET SECURITY STUDIES

The oldest of the working groups, and a special research unit of the DACS Program, the Soviet Security Studies Working Group explores the rapidly changing political conditions under which the Soviet Union formulates its security strategies. Recent research has focused on the changing perception of the threat to the Soviet Union from the West from 1985 through 1989, the Soviet Union's economic woes and the impact of these civilian problems on the Soviet military establishment, and the potential for converting Soviet military industries to civilian use.

Stephen Meyer, Working Group Leader

TECHNICAL STUDIES IN DEFENSE AND ARMS CONTROL POLICY

The focal point of the Technical Studies Working Group is on the developments in science and engineering that impact on military capabilities, including those that enhance as well as detract from arms control. The members of this working group are drawn from a variety of disciplines; all have scientific-technical backgrounds. Recent work has focused on verifiability of a ban on nuclear-armed sea-launched cruise missiles, technical capabilities of the U.S. strategic bomber force, and the potential impact of restrictions on ballistic missile flight testing.

Theodore Postol, Working Group Leader

S E L E C T E D P U B L I C A T I O N S • 1 9 8 9 / 1 9 9 0

Gibson, Christann, ed., *Contemporary Soviet Military Affairs, The Legacy of World War II*, Unwin Hyman, Inc., 1989.

Kaysen, Carl, "Is War Obsolete?" *International Security*, Vol. 14, No. 4 (Spring 1990).

Lewis, George N., Sally K. Ride, and John S. Townsend, "Dispelling Myths About Verification of Sea-Launched Cruise Missiles, *Science*, (November 10, 1989).

Meyer, Stephen M., "Economic Constraints in Soviet Defense Decision-Making," in Henry S. Rowen and Charles Wolf, eds., *The Impoverished Superpower: Perestroika and the Burden of Soviet Military Spending*, Institute for Contemporary Studies, 1989.

Meyer, Stephen M., "Decision-Making in the Development of Soviet Military Strategy," in Carl G. Jacobsen, ed., *Strategic Power: USA/USSR*, Macmillan and St. Martin's Press, 1989.

Meyer, Stephen M., "The Political Power of the Soviet Military Establishment," Occasional Paper, Joint U.S.-Japan Study on the Soviet Union, Sapporo, Japan, June 1989.

Meyer, Stephen M., "From Afghanistan to Azerbaijan, Discord Undermines the Red Army," *New York Times* (Week in Review), January 28, 1990.

Meyer, Stephen M., "Revolutionary Changes in East-West Relations Should Revitalize the Field of Security Studies," *The Chronicle of Higher Education*, February 7, 1990.

Meyer, Stephen M., "The Army Isn't Running Gorbachev," *New York Times*, May 8, 1990.

Nichiporuk, Brian, "Status-Quo States and Offensive Strategies," *Chicago Review of International Affairs* (Winter/Spring 1990).

O'Prey, Kevin P., et al., *Regaining the High Ground: NATO's Stake in the New Talks on Conventional Armed Forces in Europe*, St. Martin's Press, 1990.

Posen, Barry, "Correspondence: Net Assessment," Letters to the Editors, *International Security*, Vol. 13, No. 4 (1989).

- Posen, Barry, "The Defense Resource Riddle," in Beverly Crawford, ed., *European Assertiveness: Is There A New Role for Europe in International Relations?*, University of California Press, 1989.
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- Posen, Barry, "Finding a Strategy to Serve Our Interests," *Los Angeles Times*, January 15, 1990.
- Postol, Theodore, "In Soviet Arms Talks, U.S. Takes Troubling Stance on 'Stealth' Missiles," *Los Angeles Times*, September 10, 1989.
- Rathjens, George, "Problems in European Command and Control," in *New Technologies and the Arms Race*, Carlo Schaerf, Brian Holden Reid and David Carlton, eds., 1989.
- Rathjens, George, "How the Use of Nuclear Weapons in Europe Might Arise," in *War in Europe: Nuclear and Conventional Perspectives*, Hylke Tromp, ed., 1989.
- Rathjens, George, "For World of the '90s, a Return to Square One," *Los Angeles Times*, December 14, 1989.
- Rathjens, George, "The New Security Agenda for the 1990s," for the Committee on Common Security, February 1990.
- Rathjens, George, "Energy and Climate Change," in *Preserving the Global Environment: The Challenge of Shared Leadership*, Jessica Tuchman Mathews, ed., Norton, 1990.
- Rathjens, George, "On Cutting the Budget in Half," *Bulletin of the Atomic Scientists*, (April 1990).
- Sands, Jeffrey, et al., *Nuclear Weapons Databook, Volume IV: Soviet Nuclear Weapons*, Ballinger, 1989.
- Sapolsky, Harvey, *Science and the Navy*, Princeton University Press, 1990.
- Taylor, Brian, "Perestroika and Soviet Foreign Policy Research: Rethinking the Theory of State-Monopoly Capitalism," *Millennium*, Vol. 19, No. 1, Spring 1990.

OUTSIDE PROFESSIONAL ACTIVITIES

STEPHEN M. MEYER

- Participated in Joint U.S.-Japan Study on the Soviet Union in Sapporo, Japan. Presented paper entitled, "The Political Power of the Soviet Military Establishment." *June 16–17, 1989*
- Seminar XXI presentation, entitled "Models of Soviet Decision-making," Wye Plantation. *September 9–10, 1989*
- Presentation to the Arms Control and Disarmament Agency entitled, "Soviet Arms Control Decision-making." *October 17, 1989*
- Participated in Harvard Russian Research Center Panel, *The State of Arms Control*. Presentation entitled, "The Soviet Military's Response to Gorbachev's Arms Control Strategy." *November 6, 1989*
- Oval Office Briefing of President Bush, Secretary of State James Baker, Secretary of Defense Richard Cheney, Chief of Staff John Sununu in preparation for Malta Summit Meeting with Soviet President Gorbachev, The White House, Washington, D.C. *November 13, 1989*
- Briefing of Secretary of Defense Richard Cheney, U.S. Department of Defense, Washington, D.C. *January 27, 1990*
- Presentation to the Scientific Technical Intelligence Committee, Washington, D.C. entitled, "The Weapons Development Implications of Reasonable Sufficiency." *February 22, 1990*
- Participated in Second Biennial RAND-Hoover Symposium on the Defense Sector in the Soviet Economy, Santa Monica, California. Delivered paper: "The Prospects for Technological Innovation in Soviet Military R & D in the 1990s." *March 28–29, 1990*
- Testimony before the House Armed Services Committee, Washington, D.C., on "The Institutional Crisis in the Soviet Armed Forces." *April 25, 1990*
- Presented paper at the Mitre Corporation's Distinguished Lecture Series, Bedford, MA, entitled "Prospects for Technological Innovation in Soviet R & D." *May 1, 1990*
- Presentation before the Joint Chiefs of Staff, Washington, D.C., "Soviet Civil-Military Relations." *May 23, 1990*
- Briefing of President Bush, the White House, Washington, D.C. in preparation for May 1990 Summit with Gorbachev. *May 24, 1990*

BARRY R. POSEN

- Presented paper at the Security and Cooperation in the Arctic Conference, University of Aberdeen, Aberdeen Scotland. *June 9–11, 1989*
- Participant in Harvard CSIA study trip to the US Army National Training Center, Fort Irwin, California. *June 13–15, 1989*
- Participated in Fourth Annual Harvard CFIA Strategy and National Security Conference, Wianno Club, Cape Cod, MA. *June 22–25, 1989*
- Participated in Committee on History, Security and the Social Sciences Conference on the use of counterfactual history. *October 12–13, 1989*

- Participated in Daedalus Conference on Arms Control. Presented paper entitled, "Crisis Stability and Conventional Arms Control," to be published in *Daedalus*, Fall 1990. *January 1990*
- Participated in University of Pennsylvania Conference on Future Arrangements in Europe. *March 30, 1990*
- Participated in National Research Council Committee on Behavioral and Social Science Conference on Nationalism and War. *April 13, 1990*
- Participated in Committee on History, Security and the Social Sciences Conference on Strategic Culture. *May 10–11, 1990*

THEODORE A. POSTOL

- Presented a series of talks at the Argonne National Laboratory, Illinois. The talks were entitled, "Soviet Strategic Defense and the Future of the SLBM (Submarine-Launched Ballistic Missile)," "Fatalities from Superfires in Nuclear

War," and "SLCMs (Sea-Launched Cruise Missiles) are Destabilizing." *March 1990*

- Delivered paper at the American Physical Society Meeting, Washington, D.C. *April 1990*

GEORGE W. RATHJENS

- Participated in Workshop on Energy Policy, St. John's College, Santa Fe, New Mexico. *June 12–14, 1989*
- Participated in the Pugwash Meeting, Cambridge, Massachusetts. *July 24–28, 1989*
- Participated in the Aspen Strategy Group Meeting, Aspen, Colorado. *August 14–18, 1989*
- Participated in the Cambridge Center for Behavioral Studies Meeting on Conflict. *October 14, 1989*
- Participated in the Wingspread Meeting on Arms Control Research, Johnson Foundation, Racine, Wisconsin. *October 19–20, 1989*
- Participated in the American Academy of Arts & Sciences Meeting on Environmental Problems and Conflict. *November 9–11, 1989*
- Participated in Conference on International Security, Committee on Common Security, Washington, D.C. *January 4, 1990*
- Lectured at University of Miami Workshop for College Teachers on Nuclear Weapons and Arms Control. *January 6–9, 1990*

■ Presented Two Lectures on "Nuclear Weapons in Europe and Strategic Arms Negotiations" at University of Miami. *March 22 & 27, 1990*

- Presided over American Academy of Arts & Sciences Meeting on Environmental Change and Threats to Security held in Cambridge, Massachusetts. *March 30–31, 1990*
- Chaired Meeting on Nuclear Weapons Proliferation, International Studies Association Meeting, Washington, D.C. *April 12, 1990*
- Presented a lecture on the Presidency and Science Advising at the University of Virginia. *April 18, 1990*
- Participated in the American Assembly, Arden House, Harriman, New York. *April 19–22, 1990*
- Lectured on Environmental Issues at the Marine Biological Laboratories, Woods Hole, Massachusetts. *April 27, 1990*
- Participated in the Strategic Culture Workshop held at the American Academy of Arts & Sciences. *May 10, 1990*

**OUTSIDE
PROFESSIONAL
ACTIVITIES**

JACK RUINA

- Presented Paper at Pugwash Workshop on Nuclear Weapons in Europe. *June 3, 1989*
- Presented Paper on "French and British Nuclear Forces" at Italian Physicists Workshop on European Security in Castiglioncello, Italy. *September 22-25, 1989*
- Lectured at University of Miami Workshop for College Teachers on Nuclear Weapons and Arms Control. *January 1990*
- Guest Lecturer at University of California/San Diego. *March 1990*

HARVEY M. SAPOLSKY

- Presented paper at Organization Studies Research Panel, American Political Science Association Annual Meeting, Atlanta, Georgia. *September 1, 1989*
- Presented Congress and Defense session, Air Force ROTC National Security seminar, MIT, Cambridge, Massachusetts. *October 4, 1989*
- Session with cadets, West Point Domestic Affairs Forum, State government tour, Cambridge, Massachusetts. *October 6, 1989*
- Participant, International Arms Collaboration Project Conference, Defense Economics Program, Center for International Affairs, Harvard University, Cambridge, Massachusetts. *November 6, 1989*
- Presentation on Defense/Health Comparisons, Executive Program, Johns Hopkins School of Public Health, Baltimore, Maryland. *December 5, 1989*
- Participant, panel discussion on future threats to the oil business, Shell Oil USA, Cambridge, Massachusetts. *December 13, 1989*

- Presented Talk Entitled, "Nuclear Arms Control in a Changing World," at University of California/Irvine and at University of California/Berkeley. *March 1990*
- Gave two lectures at University of Miami entitled Technology of Nuclear Weapons" and "Must Nuclear Testing Continue?" *April 10-12, 1990*
- Lectured to the Knight Fellows at MIT on "The Future of Military Research and Development." *May 2, 1990*

- Organizer, "The Press and the Fog of War," MIT Communications Forum, Cambridge, Massachusetts. *March 15, 1990*
- Presentation on the Development of the Polaris Fleet Ballistic Missile, Large Scale Systems Committee, MIT School of Engineering, Cambridge, Massachusetts. *March 22, 1990*
- Presentation on the Navy's support of basic research, Knight Fellows Seminar, MIT, Cambridge, Massachusetts. *April 6, 1990*
- Luncheon speech, "The Peace Dividend," Harvard Institute for Retirement and Learning, Harvard Faculty Club, Cambridge, Massachusetts. *May 9, 1990*
- Olin Lecture, "The Future of the Army," United States Military Academy, West Point, New York. *May 15, 1990*

The program's courses—what MIT prefers to call subjects—are open to all students eligible to attend classes at MIT, including cross enrollers from Harvard and Wellesley. Most of the subjects are offered at the graduate level and through the Political Science Department.

Political Science doctoral candidates may use Defense and Arms Control Studies as one of their fields of concentration. Within that context, defense and arms control studies has two principal objectives: first, it introduces the student to the study of American defense policy, including the policy process, arms control, force structure and military budgets. Second, it introduces the student to the study of the role of force in international politics and how countries have historically pursued their security interests. Students are expected to develop competence in the methods of systems analysis, technology assessment, and strategic reasoning that shape the size and composition of US strategic nuclear and general purpose forces. The international military competition, the prospects for arms control and their implications for US force planning receive special consideration in several subjects. Others examine some of the same issues by contrasting US experiences and approaches with those of rivals and allies.

Students who plan to offer Defense and Arms Control Studies for the general examination take two subjects from those listed below in the Forces and Force Analysis section, and one subject each from the listing in the Defense Politics and in the Comparative Defense Policy sections. Competence in technical analysis is required. A background in economics to intermediate level with particular emphasis on macroeconomics and public finance is advisable. The subjects in the Forces and Force Analysis section will provide sufficient review of the technical approaches to be examined.

The write-off requirement is three subjects with equal distribution among the three sections preferred although approval for alternative distributions may be granted in consultation with field faculty. A number of substantive fields in the Political Science Department deal with important determinants of US defense programs and expenditures. Among the most closely related are: Science, Technology and Public Policy; American Politics; International Relations and Foreign Policy; and Soviet Studies. Students of defense policy are also encouraged to take subjects in economics.

The subjects offered at DACS are listed on the following pages . . .

FORCES AND FORCE ANALYSIS

17.476 — Analysis of Strategic Forces (Postol)

Introduces the assessment of strategic nuclear forces. Emphasizes the development of force requirements and methods of analyzing alternative force postures in terms of missions, effectiveness, and cost. The history of US-Soviet strategic competition provides the backdrop against which the evolution of nuclear strategy and forces is considered.

17.482/483 — US General Purpose Forces (Posen)

Based on the concept of Grand Strategy as a system of interconnected political and military means and ends. Topics covered include US grand strategy, the organization of the US military, the defense budget, ground forces, tactical air forces, naval forces, power projection forces, and the control of escalation. Particular episodes of military history that offer insights into current conventional forces issues are examined. Graduate students are expected to pursue the subject at greater depth through reading and individual research.

17.486 — Nuclear Weapons and Arms Control: Technology and Policy (Rathjens and Ruina)

Reviews weapons systems developments and efforts at arms control. Focuses on the interaction of technological factors with strategic concepts, intelligence assessments, and political judgment. Topics: nuclear weapons technology and effects, nuclear weapons proliferation, strategic defensive and offensive weapons, and analysis of current strategic arms programs. To the extent possible, experts who have played key roles in the topics covered are invited to give guest lectures.

17.487 — Quantitative Approaches to Defense Problems (Rathjens)

Systems analysis of policy choices in the defense/arms control area. Consideration of cost and benefit criteria. Analytical approaches and critique of applications.

AMERICAN DEFENSE POLITICS

17.460 — Defense Politics (Sapolsky)

Examines the politics affecting US defense policies. Includes consideration of intra- and inter-service rivalries, civil-military relations, contractor influences, congressional oversight, and peace movements in historical and contemporary perspectives.

17.466 — Seminar in Arms Control and Defense Policy (Rathjens and Ruina)

Assessment of post-World War II arms control efforts and major issues in defense policy. Emphasis on current issues. Topics, varying from year to year, treated in some detail. Consideration of technical questions, political questions, economic and military impact. Examples: START and space-based ballistic missile defense.

COMPARATIVE DEFENSE POLICY

17.474 — Comparative Defense Management (Sapolsky)

Examines the management issues in the organization, equipping, and direction of military forces. Of particular interest is the weapon acquisition process—its politics, administration, and effects. Comparisons made with European, Japanese, Israeli, and Soviet experience.

17.484 — Comparative Grand Strategy and Military Doctrine (Posen)

A comparative study of the grand strategies and military doctrines of the great powers in Europe (Britain, France, Germany, and Russia) from the late 19th to the mid-20th century. Examines strategic developments in the years preceding and during World Wars I and II. What factors have exerted the greatest influence on national strategies? How may the quality of a grand strategy be judged? What consequences seem to follow from grand strategies of different types? Open to undergraduates with permission of instructor.

17.490 — Soviet Defense Planning (Meyer)

Examines the political, economic, and military determinants of Soviet military policy. Soviet military doctrine, strategy, organization, and weapons procurement are studied from the perspective of Soviet defense planners.

**17.462 — Innovation in Weapons, Organization, and Strategy
(Posen and Saposky)**

Explores the origins, rate and impact of innovations in military organization, doctrine, and weapons. Emphasis on organization theory approaches. Comparison with non-military and non-U.S. experience included.

ADVANCED AND CROSS-FIELD OFFERINGS

17.468 — Foundations of Security Studies (Posen)

Aims to develop a working knowledge of the theories and conceptual frameworks that form the intellectual basis of security studies as an academic discipline. Particular emphasis on balance of power theory, organization theory, civil-military relations, and the relationship between war and politics. The reading list includes Jervis, Schelling, Waltz, Blainey, von Clausewitz, Brodie, Allison, Steinbruner, and Huntington. Students write a seminar paper in which theoretical insights are systematically applied to a current security issue.

17.470 — Military Forces and Foreign Policy (Meyer)

A comparative examination of US and Soviet defense policies, foreign policies, and the use of their military forces in the postwar period. Analyzes 20 historical cases involving deterrence of central war, coercive diplomacy, crisis management, and limited intervention. Discusses implications for military force posture planning and military strategy. Graduate students are expected to pursue the subject at greater depth through reading and individual research.

17.492 — Research Seminar in Soviet Security Studies (Meyer)

An advanced seminar that examines historical and contemporary issues in Soviet defense planning. Students select individual research topics and work with original source materials.

SEMINAR SERIES

DACS SEMINARS

This series provides a forum for discussing current security topics and the varying disciplinary perspectives on security studies. The sessions are open to the wider MIT and Boston area communities. Each is followed by a reception and a dinner which allow graduate students and faculty members to meet informally with the speakers.

1989

October 3 — Theodore Postol

Professor of Science, Technology and National Security Policy, MIT
“Fatalities from Superfires in Nuclear War”

October 17 — James Goodby

Professor, Carnegie-Mellon University
“Arms Control and the Defense Budget”

October 24 — Ethan Kapstein

Director of Economics and National Security Program, John M. Olin Institute for Strategic Studies, Harvard University and Assistant Professor of International Relations, Brandeis University
“National Security and the Global Economy”

October 31 — Bonnie Dombev

Principal Analyst, National Security Division, Congressional Budget Office
“Congressional Perspectives on Defense”

November 7 — Robert Art

Dean of the Graduate School, Brandeis University
“NATO Strategy”

November 14 — Vincent Davis

Dean of the Patterson School of Diplomacy, University of Kentucky
“Politics of DoD Reorganization”

November 28 — John Mueller

Professor of Political Science, University of Rochester
“The Fading Prospects of War Among the Industrialized Nations”

December 5 — Craig Fields

Director, Advanced Research Projects Agency, Department of Defense
“Trends in Defense Technology”

December 12 — Hayward Alker

Professor of Political Science, MIT
“The Upsala-SIPRI Armed Conflict Reports”

1990

March 13 — William Durch

Visiting Assistant Professor of Government, Georgetown University
“Coloring Arms Control Navy Blue”

March 20 — Jeffrey Ubben

Manager, Fidelity Select Defense Fund, Fidelity Management Research Corporation
“The Future of the Defense Industry: A Market Analysis”

- April 10 — Myron Weiner and Ali Banuazzi**
 Director, MIT Center for International Studies and Visiting Scholar, MIT Center for International Studies
 "Islamic Tremors in Soviet Asia: Some Regional Ramifications"
- April 24 — Brigadier General David J. Baratto**
 USA Commanding General, USAJFKSWC
 "The Future of Special Operations"

- May 1 — Colonel John A. Warden, III,**
 USAF Deputy Director for Warfighting,
 HQ U.S. Air Force
 "The Air Strategy for a Changing World"
- May 8 — Jonathan Dean**
 Union of Concerned Scientists
 "Negotiated Force Cuts in Europe:
 Overtaken by Events?"

SCIENCE, TECHNOLOGY, AND NATIONAL SECURITY SEMINARS

This series is jointly offered with the Center for Science in International Affairs at Harvard University and provides an opportunity for scientifically knowledgeable individuals in the Boston area to join with program faculty and students in examining technical topics of current policy relevance.

1989

- October 11 — Raymond Kidder**
 Lawrence Livermore National Laboratory
 "The Reliability of Thermonuclear Weapons"
- October 18 — Michael Stafford**
 Former Assistant to Paul Nitze in his role as Senior Arms Control Advisor to the Reagan Administration
 "The State of the US-Soviet Nuclear and Space Talks"
- October 25 — Paul Scully-Power**
 Naval Underwater Systems Center and NASA
 "How Transparent are the Oceans?"

- November 1 — Harry Jackson**
 Ocean Engineering, MIT
 "Modernizing Undersea Forces"

- November 8 — William Delaney**
 Lincoln Laboratory, MIT
 "Air Defense of the United States"
- November 15 — Michael May**
 Lawrence Livermore National Laboratory
 "Trends and Concerns Regarding Strategic Nuclear Forces"
- November 22 — Robert Selden**
 Chief Scientist, United States Air Force
 "The Future of Air Force Science and Technology"
- November 29 — Richard Garwin**
 IBM Research Division
 "The Use of Tags and Seals as Verification Aids in Arms Control"

seminar series continued on next page . . .

1990

February 14 — Paul Horowitz

Professor of Physics, Harvard and Member, JASON, Department of Defense
“Making High Explosives Detectable”

February 21 — Gerry Tsandoulas

Group Leader, Space Radar Technology Group, MIT Lincoln Laboratory
“Space-Based Radar”

February 28 — David Hoag

Former Technical Advisor to the President, Draper Laboratory
“Strategic Missile Guidance”

March 7 — Anthony Pensa

Associate Head, Aerospace Division, MIT Lincoln Laboratory
“Space Surveillance”

March 14 — Vice Admiral Ted Parker

(USN, Ret.) Former Director, Defense Nuclear Agency
“How We Designed the Arleigh Burke Class Destroyer”

March 21 — Richard Turco

Professor of Atmospheric Sciences, UCLA
“Nuclear Winter Update”

April 4 — Steven Weiner

Group Leader, Analysis and Systems, MIT Lincoln Laboratory
“Ballistic Missile Defense”

April 11 — Robert Millar

Consulting Engineer, Tactical Communications Division, The Mitre Corporation
“Low-Probability-of-Intercept Communications”

April 18 — Ronald Haggerty

Vice President, Research and Technology, The Mitre Corporation
“Integrated Electronics: Status and Trends”

April 25 — David McElroy

Group Leader, Satellite Communications Technology, MIT Lincoln Laboratory
“Defense Satellite Communications”

DEFENSE SCIENCE DINNER SEMINARS

The Defense Science Dinner Seminar Series was begun in 1986 initially in conjunction with the Center for Science in International Studies at Harvard University’s John F. Kennedy School of Government. The DACS Program continues to host this series of sessions that deal with issues relating defense technology to defense policy and arms control. Participants in the seminars include faculty, leaders in high technology firms, scientists and engineers, and advanced graduate students. The sessions have provided an opportunity to share ideas and perspectives on issues just at the horizon of policy concern.

April 26, 1990 —

Gen. Thomas Marsh (USAF, Ret.)

Chairman, Thiokol Corporation

“Whither Military R & D in this Changing World”

May 3, 1990 — Charles Herzfeld

Director, Defense Research and Development, Department of Defense

“Constraints and Opportunities in Defense R & D”

R E L A T E D A C T I V I T I E S A T
T H E M I T C E N T E R F O R I N T E R N A T I O N A L S T U D I E S

Established in 1952, the Center for International Studies is the principal research center within MIT dealing with international relations and comparative area studies. While located within the School of Humanities and Social Science, the Center draws faculty and staff from throughout MIT and its activities are intended to serve the Institute as a whole.

MYRON WEINER, Director

ELIZABETH LEEDS, Assistant Director

ROBERT DAVINE, Administrative Officer

SEMINAR XXI

Seminar XXI is an educational program for senior military officers, government officials and business executives in the national security policy community. The program's objectives are: (1) to develop the critical ability to assess competing theories of the connections between politics, the economy and society in foreign countries; and (2) to explore the implications of these alternative interpretations of national aims and behavior for U.S. foreign policy. Seminar XXI meets monthly from September through the end of April. Each session brings together distinguished faculty from American and foreign universities, who present alternative approaches for understanding foreign politics. Seminar XXI is directed by Professor Suzanne Berger and administered by the MIT Center for International Studies.

MIT JAPAN PROGRAM

The purpose of the MIT Japan Program is to increase the awareness of Japan by American scientists, engineering, and business leaders. Founded in 1981, it is today the largest and most comprehensive center of applied Japanese studies in the United States. Three areas are emphasized by the program: education, research and public awareness. One of its distinguishing research features is its work on Japanese defense production and policy. Professor Richard Samuels of the MIT Political Science Department is the Program Director.

DEFENSE AND ARMS CONTROL STUDIES PROGRAM • 1989/1990

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